EXAMINER'S AMENDMENT

Applicants' response to the last Office Action, filed on April 8th, 2008 has been entered and made of record.

1. An examiner's amendment to the claims of record filed on April 8th 2008 appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with N. Meyer Zohn (Reg. 55761) on 07/31/2008.

The application has been amended as follows:

Claims 3, 9, and 14 have been amended to include allowable subject matter.

Claim 11 has been amended to correct the claims dependency from claim 10 (cancelled) to claim 9.

3. An image processing apparatus for correcting an original image having distortion, comprising:

grid splitting means for performing a grid split on the original image, according to a control signal supplied from a user interface, by uniformly splitting the grid, based on a value provided in the control signal, into a plurality of grid cells having grid points at their corners, and determining correction parameters for only the grid points;

an encoding means for encoding correcting parameters, derived at the grid points obtained by said grid split, into a correction vector;

decoding means for decoding the correcting parameters and supplying the decoded correcting parameters;

horizontal correcting means for correcting distortion along the horizontal direction of said original image by performing a one-dimensional horizontal interpolation operation between designated pixels, corresponding to grid points, using horizontal correcting parameters from the correction vector, wherein the horizontal correcting parameters indicate distances in the horizontal direction by which the horizontal correcting means adjusts the designated pixels in the original image; and

vertical correcting means for correcting distortion along the vertical direction of said original image by performing a one-dimensional vertical interpolation operation between designated pixels, corresponding to grid points, using vertical correcting parameters from the correction vector, wherein the vertical correcting parameters indicate distances in the vertical direction by which the vertical correcting means adjusts the designated pixels in the original image.

9. An image processing system for correcting an original image having distortion, characterized by comprising:

encoding means for selectively encoding a horizontal correcting parameter indicating a correction quantity in the horizontal direction at a pixel point constituting said original image and a vertical correcting parameter indicating a correction quantity in the vertical direction at said pixel point;

horizontal decoding means for decoding said encoded horizontal correcting parameter supplied from said encoding means;

horizontal correcting means for correcting distortion in the horizontal direction of said original image by performing a one-dimensional interpolation operation using said horizontal correcting parameter decoded by said horizontal decoding means to said original image;

vertical decoding means for decoding said encoded vertical correcting parameter supplied from said encoding means; and

vertical correcting means for correcting distortion in the vertical direction of said original image by performing a one-dimensional interpolation operation using said vertical correcting parameter decoded by said vertical decoding means to said image obtained by the correction of said horizontal correcting means;

wherein said encoding means further comprises

a grid splitting means for performing grid split to said original image according to a control signal supplied from a user interface, by uniformly splitting the grid, based on a value provided in the control signal, into a plurality of grid cells having grid points at their corners, and determining correction parameters for only the grid points; and

a parameter compressing means for selectively compressing said horizontal correcting parameter at a grid point obtained by said grid split and supplying the compressed horizontal correcting parameter to said horizontal decoding means, and for selectively compressing said vertical correcting parameter at said grid point and [[and]] supplying the compressed vertical correcting parameter to said vertical decoding means.

11. The image processing system according to claim [[10]] 9, characterized in that:

said horizontal decoding means includes

first grid determining means for determining a grid frame enclosing each pixel point of a generated image, according to a grid generated by said grid splitting means, and

horizontal parameter calculating means for approximating each grid frame determined by said first grid determining means by a function, and for calculating said horizontal correcting parameter at each pixel point of said generated image by using said function; and in that:

said vertical determining means includes

second grid determining means for determining a grid frame enclosing each pixel point of said generated image, according to a grid generated by said grid splitting means, and

vertical parameter calculating means for approximating each grid frame determined by said second grid determining means by a function, and for calculating said vertical correcting parameter at teach pixel point of said generated image by using said function.

14. An image processing method for correcting an original image having distortion, characterized by comprising:

a grid splitting step for performing a grid split on the original image based on a control signal supplied from a user interface, by uniformly splitting the grid, based on a value provided in the control signal, into a plurality of grid cells having grid points at their corners, and determining correction parameters for only the grid points;

an encoding step for encoding correcting parameters, derived at the grid points obtained by said grid splitting step, into a correction vector;

a decoding step for decoding the correcting parameters in the correction vector and supplying the decoded correcting parameters to the image processing apparatus;

a horizontal correction step for producing a horizontally corrected image by correcting said distortion in the horizontal direction of said original image by performing a horizontal one-dimensional interpolation operation by using horizontal correcting parameters indicating [[a]] correction distances in the horizontal direction to shift pixels in said original image; and

a vertical correction step for correcting said distortion in the vertical direction of said original image by performing a vertical one-dimensional interpolation operation using vertical correcting parameters indicating [[a]] correction [[distance]] distances quantity in the vertical direction to shift pixels in said horizontally corrected image.

The preamble of claim 11 has been amended to correct its dependency by deleting the incorrect claim dependency and adding the correct value.

11. The image processing system according to claim [[10]] 11, characterized in that....

Allowable Subject Matter

2. Claims 3-6, 9, and 11-23 are allowed.

3. The following is an examiner's statement of reasons for allowance: The amendment to claims 3, 9, and 14 has overcome the known prior art. In particular, JP H11-196313 was verbally cited to the applicant during the phone interview (07/22/2008) as reading on the grid

splitting limitations of the claims presented on 04/08/2008. JP H11-196313 taught the dividing of an image into blocks, the determination of a correction parameter for each block, and the correction of the image using these parameters in order to reduce system memory requirements. However, the JP document did not teach the determination of correction values only at the grid points of the lattice. As per the previous office action claim 17 contained allowable subject matter. Furthermore, claims 4-6, 11-13, 15-16, and 18-23 depend from claims 3, 9, 14, and 17 and are allowable since they depend from an allowable claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Bloom whose telephone number is 571-272-9321. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehta Bhavesh, can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Brian Q Le/

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